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# The barriers and facilitators to nursing care for patients with permanent colostomy in outpatient centers: A qualitative study

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## Abstract:

**BACKGROUND:** Ostomy care nurses are responsible for the management of patients with colostomy from the time of diagnosis. Currently, most ostomy care services are provided in outpatient ostomy care centers in order to reduce patients' hospital stay and reduce hospitalization-related costs. Many different factors can affect colostomy nursing care provision in these centers. Identification of these factors can facilitate quality care provision.

**MATERIALS AND METHODS:** This descriptive qualitative study was conducted in 2020–2021 to explore the barriers and facilitators to nursing care for patients with permanent colostomy in Tehran and Qom ostomy centers. Participants were twelve nurses with ostomy care licenses, two adult patients with permanent colostomy for at least two years, and one family caregiver of a patient with permanent colostomy purposefully selected from outpatient ostomy care centers in Iran.

**RESULT:** Data were collected via fifteen in-depth semi-structured interviews and were analyzed using Graneheim and Lundman's conventional content analysis. The barriers and facilitators to nursing care for patients with permanent colostomy in outpatient centers came into three main categories, namely specialized capabilities of colostomy care, care continuity, and caring status in the family.

**CONCLUSION:** These findings imply that not only nurses, but also patients, family caregivers, and referral systems can influence nursing care provision to permanent colostomy. Effective management of these factors can improve the quality of ostomy nursing care.

## Keywords:

Ambulatory care, care quality, colostomy, nursing practice, ostomies

## Introduction

Colostomy is the dissection of the colon and bringing one end of it out through the abdominal wall, which leads to the elimination of stool and gas through an abnormal route.<sup>[1,2]</sup> It is a surgical modality for colorectal cancers, volvulus, and colon trauma.<sup>[3]</sup> The number of patients with ostomy is 70000 in Canada<sup>[4]</sup>, 275000–1000000 in the United States,<sup>[5]</sup> 700000 in Europe,<sup>[6,7]</sup> and 30000 in Iran<sup>[8]</sup>. Around 70% of ostomies

in Iran are colostomy<sup>[8]</sup>, and more than half of all colostomies are permanent.<sup>[9]</sup> Evidence shows that more than 70% of patients with colostomy experience postoperative problems such as physical changes, identity problems, and personal, mental, familial, and social vulnerability, and hence need quality nursing care to manage their health problems.<sup>[10-13]</sup>

Effective colostomy management needs specialized care provided by an interdisciplinary team<sup>[14]</sup> consisted of

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surgeon, social worker, ostomy association staff, nutritionist, and ostomy care nurse.<sup>[14,15]</sup> In this team, ostomy care nurse is responsible for the management of the different aspects of ostomy care from diagnosis of the underlying condition to care continuity maintenance after hospital discharge.<sup>[16,17]</sup> Nursing care for patients with ostomy includes acute and subacute postoperative care in hospital settings and long-term care by outpatient care centers after hospital discharge.<sup>[18-20]</sup>

Ostomy care by outpatient centers is the core of ostomy care after hospital discharge.<sup>[21-23]</sup> Nurses in these centers comprehensively assess patients and their personal, health, illness, and socioeconomic conditions, set care provision goals, and determine care measures for each patient

Ostomy nursing care in professional outpatient centers can reduce workload in hospital wards, reduce the waiting time for receiving care services, ensure healthcare providers of treatment effectiveness,<sup>[24-26]</sup> improve patients' access to the necessary educational materials, and help effectively fulfill their different needs.<sup>[27]</sup> On the other hand, non-continuous and ineffective care to patients with colostomy can increase the caregiver burden of family members and reduce the quality of life of patients and their family members.<sup>[28-30]</sup> For this reason, they suffer from physical, psychological, spiritual, cultural, sexual, and social complications, and it leads to the patient and family's concern about how to take care of colostomy and they are looking for professional care.<sup>[31]</sup>

Many different factors can affect colostomy nursing care. A qualitative study reported that nurses' great experience in providing hospital care to patients with ostomy, high educational level, and good specialized ostomy care knowledge facilitated ostomy nursing care.<sup>[15,32]</sup> On the other hand, nurses' limited competence in the accurate placement of ostomy bag, time limitation, and heavy workload can impair the quality of ostomy nursing care.<sup>[15]</sup> Studies show that limited access to ostomy care nurses and lack of ostomy care centers in some areas are associated with problems in ostomy care after hospital discharge such as nurse-patient visit in informal settings.<sup>[27,33]</sup> Limited number of inpatient ostomy care centers in China also negatively affects care continuity and leads to patients' limited knowledge about ostomy care after hospital discharge, while telephone- and web-based follow-up programs, periodical visits, and social associations help reduce some problems of these patients.<sup>[31]</sup> Patients with colostomy in Iran also receive limited education about ostomy care during their hospital stay, have limited awareness of ostomy care centers, have limited access to ostomy care nurses,<sup>[34]</sup>

and do not know how to receive professional ostomy care services after hospital discharge.<sup>[35]</sup>

Most previous studies into ostomy care were conducted in inpatient settings and paid limited attention, if any, to ostomy care in outpatient settings.<sup>[35]</sup> Moreover, there is limited information about the impacts of nurses and other healthcare providers on the quality of ostomy care.<sup>[14]</sup> On the other hand, while the concept of ostomy nursing care largely depends on human experiences and contextual factors, previous studies into this concept were mostly conducted using quantitative designs. Also, quantitative studies in this field have been designed only in a specific area such as skin care and types of ostomy devices and hence did not provide comprehensive understanding about the concept.<sup>[22,35-37]</sup> Therefore, qualitative studies are needed to provide more comprehensive data in this area.<sup>[38,39]</sup> The present study was conducted to narrow these gaps. The aim of this study was to explore the barriers and facilitators to nursing care for patients with permanent colostomy in outpatient centers.

## Materials and Methods

### Study design and setting

This descriptive qualitative study with a content analysis approach was conducted in 2020–2021. Qualitative designs are suitable for studying and understanding phenomena in their natural contexts and are based on individuals' real-world experiences and perspectives.<sup>[40,41]</sup>

### Study participants and sampling

Study population consisted of all nurses with specialized ostomy care license, adult patients with permanent colostomy referring to outpatient ostomy care centers, and their families. Inclusion criteria were ostomy care license and employment in outpatient ostomy care centers (for nurses), living with colostomy for at least six months (for patients), and caregiving to a patient with permanent colostomy (for family members). Due to the existence of ostomy association in Tehran and Qom and the number of ostomy centers in Tehran, this study was conducted in Tehran and Qom. Eligible participants were purposively selected with maximum variations respecting their educational level, work experience, gender, and organizational position. They were twelve nurses with ostomy care licenses, two adult patients with permanent colostomy for at least two years, and one family caregiver of a patient with permanent colostomy.

### Data collection

The interview was started based on the questions guideline, and for this reason, data were collected via fifteen in-depth semi-structured interviews held at participants' preferred time and place. Participants preferred to be interviewed face-to-face in a private

room close to the nursing station in the study setting in either the morning or afternoon. Interviews were held with an interview guide with questions such as, “Can you please explain about the influential factors on your patient care services?” (for nurses), “What are the influential factors on nursing care services based on your own experiences?” (for patients), and “What are the influential factors on nursing care services based on your own caregiving experiences?” (for family members). Other interview questions were determined based on participants’ responses to the main interview questions. At the end of each interview, the intended participant was asked whether he/she wanted to add any other point. The length of the interviews was 45–60 minutes, and all interviews were audio recorded. Data collection was continued until no new data were obtained from the interviews.<sup>[38]</sup>

### Data analysis

Data were analyzed using Graneheim and Lundman’s conventional content analysis. Each interview was transcribed word by word, and the transcript was perused for several times to grasp its main ideas. Then, meaning units were identified, abstracted, and manual coded. The generated codes were compared with each other respecting their similarities and differences and grouped into subcategories and larger categories.<sup>[42]</sup>

### Rigor

The rigor of the study was maintained through the criteria introduced by Lincoln and Guba, namely credibility, dependability, confirmability, and transferability. We had prolonged engagement with data collection and analysis for more than one year, and participants were selected with maximum variation respecting their educational level, work experience, gender, and organizational position. Member checking by several participants and peer checking by three qualitative researchers were also employed to check the accuracy of the generated codes and categories. Moreover, clear descriptions about participants’ characteristics, study context, data collection, and data analysis were provided.<sup>[42-44]</sup>

### Ethical considerations

This research is part of a larger study. The Ethics Committee of the University of Social Welfare and Rehabilitation Sciences, Tehran, Iran, approved this study (code: IR.USWR.REC.1400.217). We took into account the ethical considerations of research on human subjects, namely confidential management of participants’ data, obtaining written informed consent for participation, and giving participants the right to voluntarily withdraw from the study.

## Result

The main study participants were ten female and two male nurses with an age range of 24–60 years. Six nurses had bachelor’s degree, five nurses had master’s degree, and one nurse had PhD degree and the mean of their work experience was thirteen years.

The barriers and facilitators to nursing care for patients with permanent colostomy in outpatient centers came into three main categories, namely specialized capabilities of colostomy care, care continuity, and caring status in the family. These categories are explained together with their subcategories in what follows.

### Specialized capabilities of colostomy care

The subcategories of this category are specialized ostomy care knowledge and skills, psychological status in ostomy care, number of nursing staff, nurses’ communication with ostomy care team members, and nurses’ communication with patients and their family members.

#### *Specialized ostomy care knowledge and skills*

Expert nurses are in the frontline of care provision to patients with colostomy in inpatient and outpatient centers. Therefore, they need adequate specialized ostomy care knowledge and skills. Nonetheless, they receive no formal university-based education about ostomy care and need to develop their ostomy care knowledge and skills in informal courses. In-service educational courses on ostomy care are also implemented with very long intervals. These problems can affect the quality of their care services.

*These patients are those whose ostomy bag hole has been cut largely, for example larger than twenty millimeters, and hence, their skin has damaged. Unfortunately our nurses do not know this. Otherwise, none of the nurses like this problem to happen for any patient (P. 1).*

Experienced ostomy care nurses can provide counseling and education to novice nurses and supervise their practice in order to reduce the problems of ostomy care.

*When patients’ conditions are complicated, nurses refer to me to receive counseling or directly refer patients to me because they don’t know how to manage these patients. I have seven to eight consultations per day. Nurses personally make telephone contact with me to receive counseling and I provide them with the necessary education over the telephone (P. 11).*

#### *Psychological status in ostomy care*

Incongruence between nurses’ needs and their resources available causes them destructive physical and emotional

reactions. Problems such as unpleasant appearance of ostomy impose psychological burden on nurses.

*This is a very big problem that most of our nursing colleagues abhor ostomy care due to the unpleasant process of ostomy care and delegate all aspects of ostomy care to patients and their family members who have no information about it. This causes problems and challenges for patients and their family members (P. 15).*

### *Number of nursing staff*

The sufficient number of specialist nurses in outpatient centers plays a fundamental role in improving the health of colostomy patients and quality of care, but the shortage of ostomy care nurses limits their time for providing ostomy care and education and deprives patients, particularly patients in small towns, from care services.

*Most of the times, Due to the small number of specialist nurses, we can't spend adequate time to provide detailed education to them (P. 14).*

Besides nursing staff shortage in outpatient ostomy care centers, nursing staff shortage exists in hospital settings, particularly in surgical care wards where expert nurses are needed for specialized ostomy care provision.

*The most important problem of ostomy bag change in hospital settings is that there is no expert nurse and hence, bags are changed by nurses who are not expert in ostomy care (P. 9).*

### *Nurses' communication with ostomy care team members*

Nurses' preoperative and postoperative communications with other ostomy care team members such as physicians can prevent complications and facilitate the provision of ostomy-related education.

*There are patients whose surgeons know us, refer them to us at the time of hospital discharge, and urge them to receive education from us. Therefore, patients refer to us immediately after surgery (P. 12).*

Nurses' communications and collaboration with each other as a team during the process of care are essential to provide effective care, improve outcomes, reduce errors, and improve patients' conditions.

*Through close collaboration, we provide education to patients and refer them to ostomy care centers. In my opinion, this collaboration is very important because patients are directly referred by hospital nurses to ostomy care centers (P. 8).*

### *Nurses' communication with patients and their family members*

Nurses spend most of their work time in direct contact with patients. Therefore, they need great communication

skills to better identify patients' physical, mental, and social needs and provide them with stronger support.

*Here is like a house of hope for us because there are individuals here who carefully listen to us, provide us with education about healthy nutrition and walking, and help us have a comfortable life. They also allow us to video record their education for later use (P. 5).*

### *Care continuity*

Colostomy nursing care provision starts before surgery and continues after hospital discharge in specialized outpatient ostomy care centers. Poor patient referral to ostomy care centers, inadequate number of these centers, follow-up ostomy care, inattention to the position of ostomy care nurses, timely patient referral to other specialists, and teamwork can act as the barriers or facilitators to care provision to patients with permanent colostomy.

### *Poor patient referral to ostomy care centers*

Patients are referred to ostomy care centers with delay due to inattention to the importance of preoperative and postoperative consultations and unfamiliarity of some physicians with ostomy associations. Such poor referral causes serious problems for patients and disappointment about recovery for families.

*The doctor guaranteed that our patient would comfortably live for several years but didn't say that we would have to search everywhere for colostomy bag. They didn't inform us where to find bag. My spouse and we experience so great suffering that wishes never underwent the surgery and says that death was better than current conditions (P. 6).*

*Some surgeons or centers don't want nurses to provide education to patients before surgery because they believe that patients would avoid surgery if they get aware of postoperative problems. They justified this practice by the notion that their priority is to save patient life without considering postoperative complications such as chronic depression. I think that preoperative counseling should be provided to all patients in all hospitals (P. 7).*

### *Inadequacy of ostomy care centers*

Most ostomy care centers are located in large cities, and there are few of them in small cities and towns. Therefore, patients may have limited access to ostomy care services and need to travel long distances to large cities to receive these services.

*There is a woman whose two children have colostomy. She starts her trip from her town at 04:00 to come here and get bags (P. 2).*

*We have few ostomy associations in Iran. There are ostomy associations in some large cities founded by several benefactors (P. 15).*

### *Follow-up ostomy care*

Patients with colostomy have different unfulfilled needs. This highlights the necessity of follow-up care by ostomy care nurses. Nonetheless, these nurses have limited time to fulfill most needs of these patients and care services in outpatient centers are discontinued after several sessions.

*Ostomy care nurses rarely follow patients' conditions. Actually, this is impossible because each nurse has more than ten patients (P. 10).*

However, information technology and online follow-up services help control care services and provide better responses to patients' questions and concerns.

*Before surgery, we inform patients that we will be in online contact with them and provide them with the necessary information after surgery even if they leave this city. We have a call center that periodically controls all these affairs (P. 7).*

*I video recorded how to change the colostomy bag for a doll and sent the video to my patient over Whatsapp. Thereby, I provided education to a patient who had no access to ostomy care services (P. 12).*

### *Inattention to the position of ostomy care nurses*

Ostomy care nurses have critical role in providing support to patients, coordinating caring and therapeutic efforts, and establishing necessary communications with the members of healthcare teams. However, non-referral of patients to them due to inattention to their critical roles can postpone specialized care measures.

*Unfortunately, this is an incomplete chain. It would be better if surgeons or hospital staff referred patients to us after surgery to help us provide them with the necessary education. They even need to refer patients to us before surgery in order to determine the best ostomy site for the treating physician (P. 15).*

### *Timely patient referral to other specialists*

During patient assessment or counseling, nurses may feel the need for patient referral to the surgeon or other healthcare specialists. In these cases, timely patient referral can facilitate recovery and improve patients' and their family members' trust in nurses.

*Frequent bleeding from ostomy site can lead to anemia. In these occasions, we certainly refer patients to the surgeon to assess them. Any other nursing measure in these occasions is incorrect. One of the main responsibilities of ostomy care nurses is diagnosis but they need to avoid treatment and refer patients to the surgeon (P. 1).*

### *Teamwork*

Given the specific needs of patients with ostomy, effective care provision to them needs close collaboration among the members of healthcare teams.

*After surgery, physicians usually refer these patients to charities or nurses and patients refer to us to receive the necessary education if they have problems in placing or changing colostomy bags (P. 1).*

Patient visit by different specialists in ostomy care centers also facilitates patient recovery and support provision to family members.

*The ostomy care center has different programs for patients. For example, its staff asks patients to refer to the center to receive psychological and sexual counseling and has many different educational courses for them. Moreover, they check patients' colostomy bags when they refer to the center to receive any other service (P. 10).*

Caring status in the family A patient with ostomy in a family affects the daily activities of family members, impairs their ability to effectively perform their roles, and increases their responsibilities. Although nurses can prepare patients and their family members for ostomy care, the heavy costs of ostomy care and the shortage and low quality of ostomy care equipment act as barriers to ostomy nursing care. Therefore, patient empowerment and strong family and peer support are needed to facilitate nursing care provision to these patients.

### *The heavy costs of ostomy care*

Patients with colostomy and their family members experience heavy financial burden due to the high costs of medications, equipment, and diagnostic and therapeutic interventions.

*Unfortunately, ostomy bags are very expensive in our country because almost all of them are from foreign countries (P. 1).*

Reduced governmental support for ostomy bags and patients' subsequent use of low-quality bags cause added concerns for ostomy care nurses.

*Unfortunately, there is high level of stress in the society. The cost of the simplest ostomy bag which is currently 30000 Tomans will increase by 5-6 times and reach to 300000 Tomans after the removal of governmental subsidy. Our insurance system is very weak (P. 7).*

### *Shortage of ostomy care equipment*

Shortage of quality ostomy bags due to restrictions in its import causes challenges for ostomy care nurses.

*Previously, we selected the best bag among the 20-30 types of bags; but now, few types of bags are imported which are not appropriate for the needs of all patients (P. 12).*

When appropriate ostomy care equipment is not available, nurses have no option but to use non-standard methods to improve the lifelong of equipment.

*Unfortunately, one of my most principal challenges is that the essential equipment for wound prevention at ostomy site such as ostomy ointments, powders, and barriers has not been imported in the last several months and hence, I need to teach patients to use any other traditional or innovative method (P. 15).*

### *Low quality of ostomy care equipment*

The increasing cost of quality ostomy bags is associated with the production of low-quality bags, which increases the risk of skin lesions at ostomy site and the workload of nurses.

*Quality is really important. Currently, only low quality bags are available just to convince patients that they have access to plenty of bags. However, most of these bags are practically unusable and should be discarded before or immediately after use. These bags also cause skin wounds which need expensive dressing and wound care services (P. 8).*

### *Patient empowerment*

Patient independence in ostomy care can reduce caregiving burden of patients and their family members. Therefore, nurses need to empower patients and engage them in the process of care in order to improve their ability to return to normal life and start their social activities.

*I didn't allow our patients with ostomy to lie down and feel like they were ill. I required them to get ready and practically engaged them in bag changing through providing them with education about how to prepare ostomy bag and apply protective ointments.*

Patient education is also an influential factor on patients' independence in doing their daily activities.

*The main point is education. Patients who receive education really can effectively perform their activities. They can ask us their questions over the phone and we can send them educational videos (P. 1).*

### *Family and peer support*

Family is the main source of support for patients, has significant role in providing them with emotional support throughout the process of treatment and care, and can help nurses attain the goals of their care plans.

*We tell companions that these patients need strong support, particularly during the first three months after surgery, because these patients are disappointed, have physical problems, and think that they never achieve recovery. Some of them say that they like to kill themselves. The first three months after surgery is the most important time that companions can support their patients (P. 1).*

Peers are also a main source of social support and can influence disease management. Therefore, they should be involved in the process of patient empowerment. Good peers can share their experiences with patients with the lowest possible cost.

*There is a young girl with ostomy and has good experiences about ostomy care and best foodstuff for patients with colostomy. She works despite her young age. We took her phone number and contacted her and she provided us with education about many things and shared her experiences with us (P. 5).*

## **Discussion**

This study explored the barriers and facilitators to nursing care for patients with permanent colostomy in outpatient centers. Findings showed specialized capabilities of colostomy care, care continuity, and caring status in the family as the three main categories of these barriers and facilitators.

Specialized capabilities of colostomy care were the first category of the barriers and facilitators to nursing care for patients with permanent colostomy. Findings showed that nurses' specialized ostomy care knowledge and skills can be a determining factor in quality care provision to patients with permanent colostomy. In line with this finding, several previous studies reported that nurses' professional knowledge and skills influence patient safety and patient satisfaction with ostomy care services.<sup>[15,32,45]</sup> Another study found that nurses who worked in surgical care wards had good professional understanding of colostomy care and believed that nurses' adequate knowledge about ostomy care impacted patients' sense of responsibility and reduced postoperative complications.<sup>[46]</sup> A study also showed that nurses did not consider themselves as the main professionals responsible for ostomy care due to their limited specialized knowledge about ostomy care.<sup>[47]</sup>

Psychological status of ostomy care was another subcategory of the nurses' workload category in the present study. Work in ostomy care centers is associated with high level of occupational stress for nurses with considerable negative effects on them.<sup>[48]</sup> Most nurses, particularly novice nurses, are not ready to care for patients with ostomy due to the unpleasant appearance of ostomy. Long-term exposure to stressful conditions can lead to maladaptive coping behaviors and negative feelings such as sense of failure, constant strain, and depression among nurses.<sup>[49-51]</sup> Nurses who cannot manage these problems may eventually decide on quitting their workplace.<sup>[52]</sup> Therefore, a strongly supportive work environment is necessary for novice nurses to prevent and reduce their occupational stress.<sup>[48]</sup>

Study findings also indicated nursing staff shortage as a major barrier to nursing care for patients with permanent colostomy. The shortage of ostomy care nurses is associated with ostomy care provision by incompetent nurses, low-quality ostomy care, great risk of ostomy complications such as wound, hernia, and skin dermatitis,<sup>[31]</sup> and increased workload of ostomy care nurses.<sup>[15]</sup> However, the great clinical work experience of nurses can facilitate nursing care provision, reduce their workload, and nullify the negative effects of nursing staff shortage to some extent.<sup>[15,32]</sup> Therefore, the implementation of specialized ostomy care courses and supporting novice nurses by experienced nurses are recommended to facilitate ostomy care provision.<sup>[53,54]</sup> Moreover, we found that nurses' communication with patients, their family members, and ostomy care team members can act as barriers and facilitators to ostomy care provision. Similarly, a study showed that nurses' professional communications with other healthcare providers have direct relationship with care quality and their effective communications with patients and their family members improve their adherence to nursing recommendations and educations and facilitate nursing care provision.<sup>[45,55,56]</sup>

Care continuity was the second main category of the barriers and facilitators to nursing care for patients with permanent colostomy in outpatient centers in the present study. Ostomy care nurses who have the responsibility of maintaining care continuity after hospital discharge not only provide clinical care, but also act as an educational instructor for patients, family members, and other healthcare providers, and hence, are in a good position for quality care provision.<sup>[24]</sup> Nonetheless, our findings showed that patients with ostomy are not accurately referred to these nurses in outpatient ostomy care centers after surgery. Similarly, two studies reported that preoperative and postoperative ostomy nursing care are started with delay and patients are rarely referred to ostomy care nurses.<sup>[57,58]</sup> The findings of the present study showed physicians' inattention to the position of ostomy care nurses as a major reason for this poor patient referral. An explanation for this finding is that while nurses consider nurse-physician collaboration as a complementary role of healthcare providers in patient care, physicians consider collaboration as nurses' obedience to medical orders and hence consider nurses as their own assistants rather than professional colleagues and treat them in a hierarchical manner.<sup>[59]</sup> Poor patient referral to ostomy care nurses is associated with patients' confusion about receiving specialized ostomy care, great risk of ostomy complications, and increased workload of ostomy care nurses.<sup>[57,58]</sup> Our findings also revealed that follow-up ostomy care can act as a barrier or facilitator to ostomy care provision. However, follow-up ostomy care provision is not possible for most nurses due to

the large number of their patients and their limited time.<sup>[60,61]</sup> Therefore, telephone-based follow-up care by nurses can be used as an effective method to ensure care continuity, save time, and supervise patients' conditions after hospital discharge and can significantly increase patients' self-efficacy and self-confidence and reduce colostomy complications.<sup>[31,62,63]</sup> Ostomy care nurses are recommended to follow their patients through web-based or telephone-based methods in order to maintain care continuity and reduce the need for patient travel to ostomy care centers from long distances.<sup>[63]</sup> Moreover, preoperative referral of patients to ostomy nursing care centers, provision of preoperative education to them, and close collaboration among ostomy care team members can ensure care continuity, reduce ostomy complications, and improve patients' coping with their new conditions.<sup>[64,65]</sup>

The third main category of the barriers and facilitators to nursing care for patients with permanent colostomy in outpatient centers was caring status in the family. Patients with ostomy need to pay heavy costs due to limited insurance coverage of ostomy care equipment, their limited productivity at work, and ostomy complications such as wounds.<sup>[66, 67]</sup> Wound and infection at ostomy site are very common complications of ostomy that require nurses to use expensive dressings and sophisticated equipment and hence impose heavy financial burden on healthcare system.<sup>[68,69]</sup> Our findings also highlighted the necessity of patient empowerment and family and peer support. A study reported the effectiveness of a support program in reducing ostomy complications, re-hospitalization rate, and added costs of treatment.<sup>[70]</sup> The supportive measures of ostomy care centers such as provision of free bags to patients with limited financial ability, medical visit of patients at low cost, provision of insurance service to patients, timely patient referral to specialists, and patient education about bag and wound management and lifestyle modifications prepare patients to return to social activities. Moreover, ostomy equipment distributors, sellers, and users should receive education about the appropriate use of equipment in order to improve the effectiveness and lifetime of equipment.<sup>[32]</sup> Patient independence in ostomy care and family support is two important factors in reducing the caregiver burden of patients and family members. Patients with ostomy need modifications in their personal behaviors and hence need to develop their self-care knowledge and skills and learn skin and bag care procedures.<sup>[71-74]</sup> Therefore, adequate patient education and active patient involvement in care are necessary to improve patients' self-care abilities and reduce treatment and care costs.<sup>[68,69]</sup> Family support also has positive effects on patients' self-care behaviors and general health.<sup>[75,76]</sup> A study reported that ostomy experience is associated with stronger connections among

family members.<sup>[42]</sup> However, another study showed that ostomy causes patient isolation by family members and society.<sup>[77]</sup> Another study found that excessive supportive behaviors of families give patients senses of immobility and dependence.<sup>[78]</sup> Therefore, nurses in ostomy care centers need to provide family members with simple and understandable periodical education about the best supportive behaviors to reduce re-hospitalization rate, ostomy care costs, and mortality rate.

### Study limitations

This study was conducted in outpatient ostomy care centers. Therefore, studies in inpatient ostomy care centers are recommended to produce firmer evidence concerning the barriers and facilitators to nursing care for patients with permanent colostomy.

### Conclusion

This study shows that many different nurse-, care-, patient-, family-, and peer-related factors can act as facilitators or barriers to care provision to patients with permanent colostomy. strategies for the early identification and effective management of barriers and facilitators are essential to quality care provision to patients with permanent colostomy. Examples of these strategies are improvement of ostomy care nurses' professional conditions and improvement of patients' and family members' access to quality colostomy equipment, particularly colostomy bags. Moreover, nursing managers can implement educational programs on ostomy types, ostomy care principles, ostomy bag care, skin hygiene, wound prevention, use of ostomy care accessories, and skills for communication with patients, families, and other healthcare providers. Establishment of ostomy care centers and ostomy associations in different geographical areas and employment of at least one ostomy care nurse in each hospital can improve patients' access to ostomy care services, reduce nurses' workload, and improve ostomy care quality. Healthcare authorities' close collaboration with the distributors of ostomy care equipment is also necessary to effectively fulfill patients' need for the necessary equipment and prevent ostomy complications. A specific academic curriculum on ostomy nursing care should also be developed for nurses who are interested in ostomy care with the collaboration of nursing researchers, experienced nurses, nursing authorities, and healthcare managers. Increasing ostomy care nurses' income and improving general nurses' knowledge and skills respecting ostomy care, their psychological abilities to cope with the unpleasant appearance of ostomy, and their skills for communication with surgeons and other healthcare providers are also recommended to improve the quality and effectiveness of ostomy care services.

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### Conflicts of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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